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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,313	03/29/2001	Nagayuki Takao	0152-0555P	1864

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 06/25/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/820,313

Applicant(s)

TAKAO ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**Claim Rejections - 35 USC § 112**

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-4 and 8-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for organic solvent that is small in polarity and has electrical resistivity of not lower than  $10^9 \Omega \text{ cm}$ , does not reasonably provide enablement for any type of organic solvent. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

Case law holds that applicant's specification must be "commensurately enabling [regarding the scope of the claims]" *Ex Parte Kung*, 17 USPQ2d 1545, 1547 (Bd. Pat. App. Inter. 1990). Otherwise **undue experimentation** would be involved in determining how to practice and use applicant's invention. Although undue experimentation is not mentioned in the statute, enablement under 35 USC 112, first paragraph requires that the specification teach one of ordinary skill to make and use the invention without excessive experimentation. *Hybritech v. Monoclonal Antibodies Inc.*, 802 F.2d at 1367, 1384, 231 USPQ 81, 94 (Fed.Cir. 1986), *cert. den'd*, 107 S.Ct. 1606 (1987) and *Atlas Powder*, 705 F.2d at 1576, 224 USPQ at 413. The test for undue experimentation as to whether or not all compounds within the scope of claims 1-4 and 8-22 can be used as claimed and whether claims 1-4 and 8-22 meet the test is stated in *Ex parte*

*Forman*, 230 USPQ 546, 547 (Bd. Pat. App. Inter. 1986) and *In re Wands*, 8 USPQ2d 1400, 1404 (Fed.cir. 1988). Upon applying this test to claims 1-4 and 8-22, it is believed that undue experimentation **would** be required because:

(a) *The quantity of experimentation necessary* is **great** since claims 1-4 and 8-22 read on any type of organic solvent including polar solvents that have electrical resistivity of less than  $10^9 \Omega \text{ cm}$ .

(b) There is **no direction or guidance presented** for ink that utilizes any type of organic solvent including polar solvents that have electrical resistivity of less than  $10^9 \Omega \text{ cm}$ .

(c) There is an **absence of working examples** for ink that utilizes any type of organic solvent including polar solvents that have electrical resistivity of less than  $10^9 \Omega \text{ cm}$ .

In light of the above factors, it is seen that undue experimentation would be necessary to make and use the invention of claims 1-4 and 8-22.

3. Claims 14 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 14 recites “acrylic high molecular compound”. The scope of the claim is confusing because it is not clear what is meant by “high molecular”. Does this refer to high molecular weight? Further, what is meant by high? That is, what values are considered high?

(b) Claim 17, which depends on claim 16, which in turn depends on claim 1, recites the limitation "the crosslinkage" in line 2. There is insufficient antecedent basis for this limitation in the claim given that there is no disclosure of crosslinkage in either claim 16 or claim 1.

**Claim Rejections - 35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1-4, 8-9, 13-15, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Suthar et al. (U.S. 6,225,370).

Suthar et al. disclose ink jet ink comprising pigment such as carbon black, organic solvent, and silicone graft polymer that is dispersed in solvent and is adsorbed to the pigment. The graft portion, i.e. silicone portion, has molecular weight of 200-3,000 while the other portion of the graft copolymer is obtained from monomers including (meth)acrylates. The silicone graft polymer contains polar group such as carboxyl group. The ink includes additives such as biocide and surfactant. It is disclosed that the particle size of the pigment and silicone graft polymer combined is 50-250 nm and that the particle size of the pigment is 50-150 nm, so that the particle

size of the silicone graft polymer is 100-200 nm or 0.01-0.2  $\mu\text{m}$ . The ratio of silicone graft polymer, i.e. dispersant, to pigment is 0.17/1-1/1 which falls within the presently claimed range of 0.05/1 (5/100)- 30/1 (3000/100) while the ratio of solvent to silicone graft polymer, i.e. dispersant, is 5/1 (10/2) – 34/1 (17/0.5) which clearly falls within the present claimed range of 0.5/1 (50/100)- 100/1 (10,000/100) (col.5, lines 17-35, col.6, lines 8-10, col.6, line 52-col.7, line 24, col.7, lines 35-36, col.14, lines 60-61 and 64-65, col.15, lines 5-13, 25, and 55-59, and col.16, lines 3-16). Attention is drawn to example 2, which discloses silicone graft polymer which has number average molecular weight of 2608.

In light of the above, it is clear that Suthar et al. anticipate the present claims.

### **Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-10, 12, 13-15, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubuko et al. (U.S. 5,952,048) in view of Suthar et al. (U.S. 6,225,370).

Tsubuko et al. disclose ink jet ink comprising pigment including carbon black, organic solvent such as dimethylpolysiloxane, and silicone resin wherein the resin is adsorbed to the pigment. The viscosity of the ink is less than 10 cP and the ink is used in an ink jet printer. It is disclosed that the particle size of the pigment and silicone resin combined is 0.03-5  $\mu\text{m}$  so that it is clear that the particle size of the silicone resin and pigment each clearly overlaps that presently claimed (col.3, lines 32-39, 49-50, 54-55, and 57-58, col.5, lines 30-32, col.16, lines 10-33, and col.25, lines 21-23). From example 4, it is calculated that the ratio of solvent to silicone resin is 15/1 (300/20) which clearly falls within the present claimed range of 0.5/1 (50/100)- 100/1 (10,000/100) while the ratio of silicone resin to pigment is 2/1 (20/10) which falls within the presently claimed range of 0.05/1 (5/100)- 30/1 (3000/100).

The difference between Tsubuko et al. and the present claimed invention is the requirement in the claims of silicone graft polymer.

Suthar et al., which is drawn to ink jet ink, disclose the use of silicone graft polymer which is dispersed in solvent and is adsorbed to pigment. The graft portion, i.e. silicone portion, has molecular weight of 200-3,000 while the other portion of the graft copolymer is obtained from monomers including (meth)acrylates. The silicone graft polymer contains polar group such as carboxyl group. Example 2 discloses silicone graft polymer which has number average molecular weight of 2608 (col.5, lines 17-35, col.6, lines 8-10, col.6, line 52-col.7, line 24, col.7, lines 35-36, col.14, lines 60-61 and 64-65, col.15, lines 5-13, 25, and 55-59, and col.16, lines 3-16). The motivation for using such silicone graft polymer is to produce ink with good waterfastness and excellent print quality and optical density (col.5, lines 15-18).

Suthar et al. discloses that the silicone graft polymer is obtained from acidic groups such as carboxylic acid groups including (meth)acrylic acid and amino groups such as dimethylaminoethyl (meth)acrylate, however, there is no disclosure of the acid number or amine number of the polymer. However, given that one of ordinary skill in the art would recognize that both the acid number and the amine number effect the waterfastness, solubility, and fixation properties of both the polymer and the ink, it would have been obvious to one of ordinary skill in the art to control the acid number and amine number of the silicone graft polymer of Suthar et al., i.e. by controlling the types and amounts of monomers used to obtain the polymer, in order to produce an ink with desired waterfastness and fixation property.

In light of the motivation for using silicone graft polymer disclosed by Suthar et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such polymer as the silicone polymer in Tsubuko et al. in order to produce an ink with good

waterfastness and excellent print quality and optical density, and thereby arrive at the claimed invention.

9. Claims 1-2, 4, 5-9, 11, 13-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubuko et al. (U.S. 5,952,048) in view of Ryntz et al. (U.S. 4,673,718).

Tsubuko et al. disclose ink jet ink comprising pigment including carbon black, organic solvent such as dimethylpolysiloxane, and silicone resin wherein the resin is adsorbed to the pigment. The viscosity of the ink is less than 10 cP and the ink is used in an ink jet printer. It is disclosed that the particle size of the pigment and silicone resin combined is 0.03-5  $\mu\text{m}$  so that it is clear that the particle size of the silicone resin and pigment each clearly overlaps that presently claimed (col.3, lines 32-39, 49-50, 54-55, and 57-58, col.5, lines 30-32, col.16, lines 10-33, and col.25, lines 21-23). From example 4, it is calculated that the ratio of solvent to silicone resin is 15/1 (300/20) which clearly falls within the present claimed range of 0.5/1 (50/100)- 100/1 (10,000/100) while the ratio of silicone resin to pigment is 2/1 (20/10) which falls within the presently claimed range of 0.05/1 (5/100)- 30/1 (3000/100).

The difference between Tsubuko et al. and the present claimed invention is the requirement in the claims of silicone graft polymer.

Ryntz et al. disclose hydroxy functional polysiloxane graft copolymer which is crosslinkable by hydroxy reactive crosslinking agent. The graft copolymer has number average molecular weight of 1,000-15,000 and hydroxyl number of 30-300. The graft portion, i.e. silicone portion, has molecular weight of 1,000-12,000. It is further disclosed that the graft

copolymer contains polyester crosslinkages (col.1, line 65-col.2, line 6, col.3, lines 14-19, col.5, lines 55-60, and col.6, lines 43-48).

The motivation for using such silicone graft copolymer is to form flexible cured coating over a variety of substrates wherein the coating has excellent weatherability (col.2, lines 1-3 and 60-61).

In light of the motivation for using silicone graft copolymer disclosed by Ryntz et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such copolymer as the silicone polymer in Tsubuko et al. in order to produce an ink with good flexibility and weatherability, and thereby arrive at the claimed invention.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 10330684 discloses crosslinked silicone graft copolymer.

Kuo et al. (U.S. 5,854,308) disclose silicone/polyacrylate graft copolymer, however, there is no disclosure of particle size or that the copolymer is adsorbed onto pigment as presently claimed.

Kappele et al. (U.S. 5,656,071), similar to Suthar et al. utilized above, disclose silicone graft polymer.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

Art Unit: 1714

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie Shosho  
6/21/02

**VASU JAGANNATHAN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**

Art Unit: 1714

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CS

Callie Shosho  
6/21/02

*Vasu Jagannathan*  
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